

real evidence that this is the case, as many instances for and against the contention can be given. Whether the child of elderly parents is healthy or not depends not so much upon the age as upon the health of the parents; for a man with, say, Bright's disease—the prevalent ailment of men over sixty—will certainly not beget a healthy offspring. It would seem, however, from a general study of constitutional defects which are inherited, that the elder members of the family are more liable to suffer than the younger. In the case of tuberculous families, as well as with stocks giving no parental tuberculous history, the elder offspring, especially the first and second, appear subject to tuberculosis at a very much higher rate than the younger members.

This observation is of especial interest when the modern notion of the limitation of families is considered. There are few "younger members" to the small and limited families of to-day. The two or three children born to a couple of parents would represent the elder branches only of the "old-fashioned family" of a dozen of some fifty years ago. We have just seen that Prof. Pearson declares that the first and second child are endowed with all forms of pathological heritage, and if there are only two children in the family, the limited family of the present day is producing a community of persons highly endowed with a pathological heritage, uncorrected in its national deteriorating effect had there been later children of the marriage—that is, children less likely to have inherited in a marked manner the pathological tissues or diathesis of their parents.

If we are to believe the above statement, and there is no evidence against its being logically acceptable, we are brought face to face with the question of the benefit or otherwise of the law of primogeniture which so largely obtains all the world over. From a racial standpoint the first and second children, as we have seen above, are the worst members of the family to beget a stock free from pathological taints; yet it is to the eldest son that the preservation of the family, and its possessions, its titles, or its wealth, is entrusted. To push this point to its seemingly logical conclusion, it would come about that the eldest son of one family marrying the eldest daughter of another family would in time lead to an effete progeny and the extinction of the power of rearing children. As a prophylactic agency in this scheme of pathologic inheritance, it would appear essential, to correct the deteriorating effects of intermarriage between elder members of different families, that the eldest child of one family should marry with a younger child of another family.

The limitation of families to one or two children is therefore a highly detrimental factor in national eugenics, for not only is there no allowance for what appears to be the inevitable waste attaching to child life, but the progeny, if thus produced only during the early years of married life, is calculated to add in time more affected individuals to the community, seeing it is the first-born children especially that inherit family traits of physique and diathesis.

The predominance of race depends on the preservation of the mentally and physically fitter stocks. In the struggle for existence amongst primitive peoples this is "naturally" provided for by the exigencies of life, but amongst a highly civilised race, such as our own, the fitter stocks appear likely to be weakened "by the lessened intensity of the intraracial struggle and the differential limitation of the family."

It is scarcely necessary to state that Prof. Pearson has handled this subject, as he handles all the problems he deals with, in a manner at once logical, unbiased and rigidly scientific. We are willing to

accept Prof. Pearson's conclusions from the basis he starts from; but until the basis is widened a hundred fold it would be rash to formulate definite and incontrovertible deductions in regard to the effects of the inheritance of any pathologic diathesis for any given ailment.

SIR RICHARD STRACHEY, G.C.S.I., F.R.S.

ON Wednesday, February 12, there passed away, at the advanced age of upwards of ninety years, a distinguished son of a distinguished Anglo-Indian family, Lieutenant-General Sir Richard Strachey, R.E., G.C.S.I., LL.D., F.R.S. To give any adequate impression of a career which extended from 1836, when Richard Strachey left Addiscombe to join the corps of engineers of the East India Company, to 1907, when he retired from the chairmanship of the East Indian Railway Company, would be in any case a difficult task, and when, as in this case, a life of nearly ninety-one years is more remarkable for the versatile activity of the spirit that animated it than for its length the task becomes insuperable.

He was elected a Fellow of the Royal Society in 1854 for scientific work in botany, geology and physical geography, carried out while he was stationed at Nani Tal, in the Kumaon Himalayas, whither he was transferred from engineering work in connection with the Ganges canal on account of repeated attacks of fever. In 1897, the year in which he was appointed Knight Grand Commander of the Star of India, a Royal medal was conferred upon him for his investigations in physical and botanical geography and meteorology. "Two of the most recent of these," quoting from the award, "are recorded in his report, published in 1888, on the barometrical disturbances and sounds produced by the eruption of Krakatoa and in his paper in the *Phil. Trans.* of 1893, entitled 'Harmonic Analysis of Hourly Observations of the Temperature and Pressure at British Observatories.' These, while important in themselves, are but the last of a long series of valuable memoirs. He was the first to treat scientifically the physical and botanical geography, geology, and meteorology of the Western Himalaya and Tibet. He also first observed the occurrence of a regular series of fossiliferous rocks, from the Silurian upwards to the north of the great snowy axis of the Himalaya. His numerous papers on these subjects, dating from the year 1847, are published in the Journals of the Royal Asiatic, Geological, and Royal Geographical Societies' Proceedings, and in the reports of the British Association."

In 1873 he had returned home and was appointed a member of the meteorological committee of the Royal Society which controlled the Meteorological Office, established in 1867; he was a member of Sir William Stirling Maxwell's committee which revised the constitution of the governing body of the office, and was a member of the council which replaced the committee in 1876. After a further period of absence in India on special duty, he resumed his place on the council; in 1883, upon the death of Prof. H. J. S. Smith, he was appointed chairman and filled the office for twenty-two years. He was president of the Royal Geographical Society from 1887 to 1889. He received the Symons medal of the Royal Meteorological Society in 1906.

His scientific activity, although closely interwoven with the rest of his work, was only a part of his life. He won distinction as an engineer in the conduct of irrigation works and as a soldier in the Sutlej campaign. His greatest claim to remembrance is based upon his achievements as head of the Indian Public

Works Department, and the various successful organisations which he initiated in that capacity. It is not too much to say that he and his younger brother John, who died about two months ago, were for many years the principal figures in the administration of the Indian Empire. "The Finances and the Public Works of India," the title of a book which they published, is not inapt as a description of the position of the two brothers under Lord Mayo. Between 1871, when Richard Strachey returned to England, and 1879, when he finally retired from India to resume his place on the Indian Council, he held various appointments in connection with the India Office or in India, including the chairmanship of the Madras Famine Commission of 1878. In 1889 he became chairman of the East Indian Railway Company, and added to his reputation for business capacity by the successful administration of that undertaking. As a financier he represented India at the Monetary Conference at Brussels in 1892, and as a geographer he was one of the delegates of Great Britain at the Prime Meridian Conference at Washington in 1884.

My personal recollection of Sir Richard Strachey goes back to 1880, when I was engaged upon some work for the Meteorological Council. He was keenly interested in questions about the distribution of water vapour in the atmosphere. The vertical distribution was the subject of a paper in the Proceedings of the Royal Society in 1862. My recollection is that he had a good deal to do with disposing of an idea that I have seen attributed to Herschel, that in reckoning the pressure of the atmosphere, water vapour did not count. I write vaguely on this point, because to reconstitute the physical conceptions upon which meteorology was based before the 'sixties is to place oneself in the age when heat was still regarded as material, and the conservation of energy was an imperfectly formulated idea.

As president of the Royal Geographical Society he endeavoured to promote the teaching of geographical science, and he came to Cambridge to give lectures on geography, a missionary effort undertaken to show that geography was not really beneath the attention of a university. The distribution of vapour pressure in the atmosphere as determined by his own observations up to 18,000 feet in the Himalaya was again discussed. At that time the university recognised his contributions to the advancement of science by conferring the LL.D. degree. He returned to the subject of aqueous vapour in the atmosphere again in the determination of the heights of clouds by photographic observations at Kew, a preliminary report on the measurements was contributed to the Proceedings of the Royal Society in 1891, and there still exists a great store of unworked material.

From 1897 onwards I was closely associated with Strachey in the management of the Meteorological Office, and I speak without hesitation for his colleagues, Galton, Wharton, Buchan, Darwin, Field, and Scott, in saying that association with him was not the least among the privileges which attached to membership of the council. His clear insight into the questions at issue, his perfect lucidity in thought and expression, the logical marshalling of facts in the official documents which he wrote as chairman, will always be memorable. He had not much patience with people who were imperfectly acquainted with the facts of a case under discussion, and he never cared to argue with them, but difference of opinion on lines of policy, even when ill expressed, never ruffled his serenity in the conduct of business. From time to time while he was chairman, the office was subject to criticism, which was not always fair, but he never

complained. He was always content to attribute the criticism to want of knowledge of the facts. He would not even let us indulge in the semi-official pastime of abusing the Treasury. Their responsibility had to take account of an aspect of the matter with which we were not cognisant, namely, where the money was to come from, and we must be content to accept a judgment that had to reckon with public opinion in its executive form as well as with scientific aspirations. Speaking for myself, as one accustomed for many years to the details of business of college meetings and university syndicates, Strachey's methods of transacting corporate business were a revelation.

As regards his later contributions to the science of meteorology, some words of explanation are necessary. He had watched, and indeed had been largely instrumental in providing the facilities for, its study both in India and in this country, on the new lines of the comparison of results for different parts of the country or of the world. He was conscious that the new science required a new method, that the method of the physical laboratory, which aims at elucidating a physical process by experiments specially directed thereto, was inapplicable to the case of the free atmosphere. Those who are critical of the vast accumulation of meteorological data which is going on are apt to be unaware of the fact that data have to be collected in advance, and that, to this day, nearly every attempt to deal with a meteorological problem of any importance is baffled by the want of data; they are equally unmindful of another noteworthy fact, namely, that in meteorology comparison is of the essence of the science. The meteorologist is absolutely dependent upon other people's observations; his own are only useful in so far as they are comparable with those of others. Thus the time, trouble, and money spent upon organisation are not the expressions of limited scientific ambition, but a primary condition for securing indispensable facilities. Strachey's scientific judgment was extraordinarily acute. He was quite prepared to carry on investigation to a speedy issue when circumstances permitted, as in the investigation of the Krakatoa eruption already alluded to, which led to the recognition of a drift from east to west in the upper air of the equatorial regions as a primary meteorological datum. In dynamical meteorology he was convinced that the most promising mode of attack was not to look for a direct dynamical explanation of the striking features, the 'eccentricities' of the day's weather, which are the almost fortuitous result of many causes combined in various phases, but to seek for the relations between regular sequences and their causes underlying the apparently arbitrary variations. For this reason the methods of harmonic analysis specially attracted him, and he was disposed to regard anything less general than five-day means as unmanageable. He never completed the work on harmonic analysis that he had in hand. He attached particular importance to the third Fourier component of diurnal variation, because the length of the day in these latitudes oscillates between one-third and two-thirds of the twenty-four hours. A few years ago he took up again the investigation of the question, and he has left a considerable amount of unfinished material.

He was not to be driven from a position of modest optimism about such matters, and always explained that for a new science the progress made in the last fifty years is quite as great as could fairly be expected.

But he was no friend of the unnecessary compilation of data or of the unlimited extension of mean values. Almost the last contribution that he gave me was a

computation of the number of years necessary to reach a mean value for temperature within the limits of the probable error of the mean value for a single year, based upon some tables published in 1902 for the extrapolation of mean values. He was always more concerned to present meteorological data in a form amenable to computation than to increase their volume or detail. When the weekly weather report was initiated in 1884, he provided formulæ for computing the true daily mean from the maximum and minimum temperatures for the day, and for computing the amount of effective and ineffective warmth as referred to a base temperature of 42° F., which are still in use. He once astonished me by pleading for graphical representation as being easier to read than columns of figures, for he could extract the meaning of a page of figures with a facility that made the discussion of results with him an indispensable part of any piece of work that was in hand. Yet he was more than eighty years of age when we had to transact this kind of business together. He never lost his appreciation of new methods which were sound, or of new projects which were promising. Throughout his administration of the office he held to a high scientific ideal while maintaining the efficiency of such daily work as was required for public use and for international cooperation. His scientific horizon was a wide one. With Stokes and Balfour Stewart, he was largely instrumental in providing means for the organised study of the sun, which had been commenced in this country and in India by Sir Norman Lockyer, in order to trace the primary causes of those great meteorological fluctuations which exhibit themselves in alternations of drought and plenty in India, a study which, pursued for many years at the Solar Physics Observatory at South Kensington and at Kodaikanal, in India, has recently taken its place among the greater international organisations. As head of the Public Works Department in India, he transferred meteorological work in that dependency from a provincial to an Imperial basis under Blanford and Eliot, and laid the foundation for the admirable organisation of which the Government of India and its scientific staff now enjoy the advantage. At the same time, he initiated the forestry department and the application of botanical science to the service of the public in that department.

Probably no single person had clearer views of the future that lies before meteorological work as a matter of practical influence upon everyday life, or was more fully conscious of the long years of observation, organisation and study that are necessary to secure the advantages which will ultimately more than reward the long years of patient inquiry.

Above the mantelshef of the unpretentious room over a piano shop in Victoria Street, which for more than forty years has been the chief centre of meteorological work in this country, there is a clear-cut profile of an old but by no means aged man, giving an unmistakable presentment of intellectual strength altogether undisturbed by side-issues and petty difficulties. Such indeed was Strachey. Beneath the portrait over his characteristic signature are the last words of a letter written about an office balance sheet that I thought more than usually depressing. "On the whole there is nothing to complain of." For meteorologists this is, at times, a hard saying; but to me at least it is entirely characteristic of the spirit with which he insisted upon meeting the difficulties that confronted us. "A heart that is established and will not shrink," a keen appreciation of the practical services which science can render in the present and in the future, a simple determination to regard

the whole, to make the most of the means at his disposal without grumbling—these are the abiding recollections of the ten years of our association at the close of a long life devoted, with untiring energy, to the service of his country.

W. N. SHAW.

NOTES.

DR. C. CHREE, F.R.S., has been elected president of the Physical Society of London for the ensuing year.

THE annual congress organised by the Prehistoric Society of France will be held this year at Chambéry from August 24 to August 30.

M. BOUQUET DE LA GRYE has been elected president of the Bureau des Longitudes for 1908, M. Poincaré vice-president, and M. Bigourdan secretary.

PROF. W. J. SOLLAS, F.R.S., was elected president of the Geological Society of London at the anniversary meeting on February 21.

THE director of the Royal Meteorological Observatory at Agram, Hungary, informs us that the founder and former director, Prof. Ivan Stožir, died on February 12 after a short illness.

DR. H. F. OSBORN, one of the vice-presidents of the American Museum of Natural History and curator of vertebrate palæontology, has been elected president of the museum in succession to the late Mr. Morris K. Jesup.

It is reported from Berlin that Mr. Andrew Carnegie has given half a million marks (25,000l.) to the Robert Koch fund for the campaign against tuberculosis. The amount collected so far for carrying out research work in connection with the disease amounts to 800,000 marks (40,000l.).

AN exhibition and sale of farm and garden produce, organised by the Women's Agricultural and Horticultural International Union, will be held in the gardens of the Royal Botanic Society, Regent's Park, N.W., on Wednesday, July 15. All communications should be addressed to the secretary, Miss Eileen Johnson, c/o Mrs. T. Chamberlain, 5 Priory Mansions, Drayton Gardens, S.W.

THE American Society of Naturalists has made arrangements to celebrate the one hundredth anniversary of Charles Darwin, in cooperation with the American Association for the Advancement of Science, on the occasion of their meetings in Baltimore in 1908. The Society of Naturalists, we learn from *Science*, will be represented on the committee of arrangements by the president, the secretary, and several members.

ON Thursday next, March 5, Sir John Rhys will begin a course of two lectures at the Royal Institution on "Early British History and Epigraphy," and on March 7 Prof. J. J. Thomson will commence a course of six lectures on "Electric Discharges through Gases." The Friday evening discourse on March 6 will be delivered by Prof. John Milne on "Recent Earthquakes," and on March 13 by Chevalier G. Marconi on "Transatlantic Wireless Telegraphy."

REPLYING to a question in the House of Commons on Tuesday, Mr. Churchill said:—"It is impossible to obtain accurate statistics regarding the mortality from sleeping sickness in Uganda, but, in a recent despatch, the Governor has estimated the number of deaths at 200,000 during the past seven years. Every effort is being made by the